

June 2003

Mantech's Lean Value Chain successes relieves critical part shortage

by Gary Cunningham, Materials and Manufacturing Directorate

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — If a warfighter has a flying mission, but he can't get his aircraft out of the shop, then he's not doing anyone much good. That has been the plight for many Air Force and Army crews in the past whenever their aircraft was scheduled for periodic maintenance at the depot.

The depot work is vital to sustaining the aircraft fleet, but in many cases it takes too long to perform maintenance. Until recently, an aircraft engine in depot maintenance could take over 200 days to repair if it was in need of a critical part that was not in stock.

Those days are gone now, thanks in large part to engineers from the Manufacturing Technology (ManTech) Division of the Air Force Research Laboratory's Materials and Manufacturing Directorate.

ManTech, in cooperation with KBSI, Inc., of College Station, Texas, developed and implemented a Lean Value Chain (LVC) program that dramatically decreased critical part shortages for Air Force and Army depots. A goal of LVC, to reduce critical part resolution time by 50 percent, has been exceeded. Improved mission readiness of Air Force jet engines, such as the General Electric F100 series, and the Army's T700 helicopter engines has been achieved by returning them to service from routine depot maintenance almost twice as fast as before.

A critical part is any component, that when not available, stops the repair of a major weapon system subassembly, keeping that system out of action. Parts went critical for reasons like sole-source contract negotiation delays, delayed deliveries from the Defense Logistics Agency, and increased part condemnation rates due to age. Prior management procedures for repair parts inventory had proved inefficient at the Oklahoma City Air Logistics Center (OC-ALC) and the Army's Corpus Christi Army Depot (CCAD). Critical part resolution time in the OC-ALC General Electric rotor repair shop had increased to an average of more than 140 days.

These issues meant the depots were unable to anticipate and identify critical parts in advance, determine the best course for timely, cost-effective critical part resolution, and monitor and accelerate the critical part resolution process.

The LVC for Critical Part Procurement project was thus funded by ManTech as a solution to these problems, and was supported by OC-ALC and CCAD. The implementation of lean principles, re-engineered processes, and advanced technologies through largely computer-based resolution strategies proved to be the solution as they provided a more efficient method of running the depot operation.

First, a value stream analysis was conducted in the OC-ALC engine and the CCAD T700 helicopter engine line. Tools and technologies for a lean critical part procurement process were then implemented. The benefits were then captured and transferred to other repair lines, e.g. the KC-135.

The increase in quantity of work was dramatic. At OC-ALC, engine rotor overhauls went from 84 per month to 156 per month, while the average critical part resolution time went from 143 days down to 61 days. At CCAD, engine overhauls increased from 10 per month to 40 per month, while the engine cycle time through the shop decreased from an average of 326 days to just 176 days.

LVC has resulted in improved visibility of aircraft status and forecasting capability, and better information that allows more effective management decisions to be made. Management can now immediately identify inventory shortages and has greater flexibility in scheduling subsystem overhauls. There have been significant reductions in the number of critical parts, time wasted searching for parts, and parts inventories on-hand.

Increasing the mission readiness of weapon systems needed by the warfighter is the greatest payoff from the LVC program, but it is not the only one. In addition to the rate increase in rotor and helicopter engines overhauls, there has been significant cost savings. At OC-ALC, the number of rotor repair kits on-hand went from 436 to 208, resulting in an approximate \$25 million one-time savings plus \$4.5 million per year in recurring savings. @